WHAT IS CLAIMED IS:

1. A composite structure for subsequent growth epitaxial film layer thereon comprising:

a base substrate; and,

a buffer layer of $SrTi_xRu_{1-x}O_3$ where $0 < x < 1$ thereon said base substrate.

2. The composite structure of claim 1 further including at least one layer of a second buffer material upon the layer of $SrTi_xRu_{1-x}O_3$ where $0 < x < 1$.

3. The composite structure of claim 1 wherein said base substrate is of a material selected from the group consisting of polycrystalline metals, polycrystalline ceramics, single crystal lanthanum aluminum oxide, single crystal aluminum oxide, single crystal magnesium oxide, silica and glass.

4. The composite structure of claim 1 wherein said base substrate is of a material selected from the group consisting of polycrystalline ceramics, single crystal lanthanum aluminum oxide, single crystal aluminum oxide, single crystal magnesium oxide, silica and glass.

5. The composite structure of claim 1 further including at least one layer of a second buffer material upon the layer of $SrTi_xRu_{1-x}O_3$ where $0 < x < 1$.

6. A composite structure for subsequent growth of a epitaxial film layer thereon comprising:

a base metallic substrate having a layer of magesium oxide thereon; and

a buffer layer of $SrTi_xRu_{1-x}O_3$ where $0 < x \leq 1$ thereon said layer of magesium oxide.

7. The composite structure of claim 6 wherein said buffer layer is strontium titanate.

8. The composite structure of claim 6 wherein said layer of magesium oxide is deposited by ion-beam-assisted deposition.

9. The composite structure of claim 6 wherein said buffer layer is a mixture of strontium titanate and strontium ruthenate.

10. The composite structure of claim 6 further including at least one layer of a second buffer material upon the layer of $SrTi_xRu_{1-x}O_3$ where $0 < x \leq 1$.

11. The composite structure of claim 10 wherein the second buffer material is cerium oxide.

12. The composite structure of claim 6 wherein the high quality epitaxial thin film is an epitaxial high temperature superconducting thin film.

13. The composite structure of claim 6 said mixture of strontium titanate and strontium ruthenate includes about 50 percent by weight strontium titanate and about 50 percent by weight strontium ruthanate.

14. A superconducting article comprising:

a base metallic substrate including one or more intermediate layers;

a layer of magnesium oxide deposited by ion-beam-assisted deposition thereon said one or more intermediate layers of said base metallic substrate;

a buffer layer of $SrTi_xRu_{1-x}O_3$ where $0 < x \leq 1$ thereon said layer of magnesium oxide; and,

a top-layer of a high temperature superconducting material upon the buffer layer of $SrTi_xRu_{1-x}O_3$ where $0 < x \leq 1$.

15. The superconducting article of claim 14 wherein the high temperature superconducting material is YBCO.

16. The superconducting article of claim 15 further including a layer of a second buffer layer between said layer of a a mixture of strontium titanate and strontium ruthenate and said top-layer of a high temperature superconducting material.

17. The superconducting article of claim 16 wherein the second buffer layer is cerium oxide.

18. The superconducting article of claim 14 wherein said buffer layer is strontium titanate.

19. The superconducting article of claim 14 wherein said buffer layer is a mixture of strontium titanate and strontium ruthenate.

20. A process of preparing a superconducting article comprising:

depositing a layer of magnesium oxide by ion-beam-assisted deposition upon a base metallic substrate including one or more intermediate layers thereon;

depositing a buffer layer of $SrTi_xRu_{1-x}O_3$ where $0 < x \leq 1$ thereon said layer of magnesium oxide a deposition temperatures between about 800°C and 825°C ; and,

depositing a top-layer of a high temperature superconducting material upon the buffer layer of $SrTi_xRu_{1-x}O_3$ where $0 < x \leq 1$.